

COURSE TITLE AND NUMBER: Programmable Logic Controllers TRA 165

North Central Michigan College

NCMC MASTER COURSE SYLLABUS FOR YEARS 2001-2003

DIVISION/AREA: Business and Technology

DEPARTMENT:

DIVISION DIRECTOR: Robert J. Marsh, Ph.D., P.E.

ORIGINATOR:

DEAN OF INSTRUCTION: Timothy Dykstra, Ph.D.

TOTAL HOURS OF INSTRUCTION: 3 LECTURE: 2 LAB: 2 TOTAL CONTACT HOURS: 70.4

COURSE NUMBER: TRA 165

CREDIT HOURS: 3

COURSE TITLE: Programmable Logic Controllers

TRANSFERABLE YES: NO: X TO:

PREREQUISITE(S)/COREQUISITE(S)/ADVISORY: None

CATALOG DESCRIPTION:

An introduction to the use of programmable logic controllers (PLC). Basic components of the PLC along with the interface to hydraulic/pneumatic systems and sensors are discussed. Some higher level functions such as sequencers and math and logic functions are also covered.

GENERAL EDUCATION OUTCOMES:

- Think critically and analytically
 - Write and speak effectively
 - Independently acquire knowledge
 - Select and use mathematical tools for problem solving and decision making
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COURSE OBJECTIVES & OUTCOMES:

At the completion of this course, the student shall gain an understanding of the following topics:

- Basic ladder logic programming
- Construction of control circuits, including transformers, fuses, circuit breakers and disconnect switches
- The use of symbols and documentation for relay logic
- Evolution of PLC technology
- Current uses of PLC's in industry

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- Basic and intermediate PLC programming techniques
 - The PLC-computer interface; the PLC-hydraulic/pneumatic interface
 - Practical applications of PLC programming
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METHODS OF INSTRUCTION:

Lecture, in-class exercises, individual and group out of class assignments

METHODS OF EVALUATION:

In class exercises	15%
Homework assignments	25%
Group project(s)	25%
Exams	25%
Participation/attendance	10%

REQUIRED TEXTS: TBD

OPTIONAL SUPPLEMENTARY MATERIALS:

Reasonable accommodations may be provided for students with documented physical, sensory, cognitive, systemic, and/or psychiatric disabilities. Please contact the Education Opportunity Program (EOP) at (231) 348-6687 to arrange services for this course.

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TIME ALLOWANCE AND SEQUENCE OF INSTRUCTION:

Suggested sequence

Week	Topic
1	Introduction to the class, overview of PLC history and uses
2	Relay and ladder logic
3	Relay and ladder logic, continued
4	Switching devices; input output devices
5	Logic diagrams and documentation
6	Basic PLC components
7	Exam I PC interfacing
8	Hydraulic principles
9	Hydraulic principles
10	Hydraulic interfacing Lab experiments
11	Pneumatic principles and interfacing
12	Pneumatic interfacing Lab experiments
13	Introduction to group project Possible field trip for study
14	Lab time on project Preliminary presentation
15	Final presentations of projects
16	Final Exam

APPROVED FOR ADOPTION BY THE CRD/AP COMMITTEE ON _____